

APPARATUS FOR DISPLAYING GUIDE LINE FOR PICTURE ADJUSTMENT IN MONITOR

BACKGROUND OF THE INVENTION

5 1. Field of the Invention

The present invention relates to an apparatus for displaying guide line for picture adjustment in a monitor, and more particularly to an apparatus for displaying guide line for picture adjustment in a monitor, which displays a guideline around a periphery of the screen when adjusting the picture, thereby enabling a user to confirm the adjusted result.

10 2. Description of the Related Art

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In general, if a user selects a picture adjustment mode, the on-picture display (OSD) device displays patterns, which are used for displaying specified items for adjusting the picture such as size, position, pin cushion, on the screen.

The user can confirm the varying state of an adjustment value set by himself/herself
15 by means of a numerical value or a bar appearing within the OSD of the picture to display the state of adjustment.

Fig. 1 shows the conventional OSD device for a monitor comprising a control section 11, an OSD generating section 12, an image generator 13, an image amplifier 14 and a display section 15.

20 The control section 11 is mounted inside of a monitor and outputs a control signal so that the OSD for a picture adjustment mode can be displayed at a predetermined position of the picture in accordance with an input of a picture adjustment menu key by a user. Thus, the control section 11 exchanges data with a system in a main body of a PC. The OSD generating section 12 generates the corresponding OSD in accordance with a control signal
25 from the control section 11. The image generator 13 is mounted on the main body of the PC, and outputs image signals R, G, B to construct a picture corresponding to the control signal from the system in the main body of the PC. The image amplifier 14 combines the OSD image outputted from the OSD generating section 12 with the image signals outputted from

the image signal generator 13 to amplify the combined signals. The display section 15 displays an output of the image amplifier on the screen.

The operation of the conventional OSD displaying device for a monitor will now be explained in further detail.

5 If the user first inputs a picture adjustment menu key through a key input section of the monitor, the control section 11 of the monitor recognizes the input.

The control section 11 locates the position for displaying the OSD in accordance with the horizontal and vertical synchronous signals inputted from the system in the main body of the PC, and outputs a command for generating the OSD to the OSD generating section 12 so
10 that the OSD for picture adjustment mode can be embodied at the corresponding position.

Subsequently, the OSD generating section 12 generates image signals to construct the corresponding OSD in accordance with the control signal outputted from the control section 11 to the image amplifying section 14.

Meanwhile, the image signal generator 13 outputs the image signals R, G, B to the
15 image amplifying section 14, as shown in Fig. 2.

The image amplifying section 14 then combines an output from the OSD generating section 12 with an output from the image signal generator 13, and amplifies the combined outputs to a predetermined level so as to output the amplified image signal to the display section 15.

20 As shown in Fig. 3, the display section 15 displays the signals outputted from the image amplifying section 14 at a predetermined position of an OSD display window such as in the middle or at a lower portion of the screen after undergoing a series of signal processing.

At this time, the user can confirm the picture adjustment result in the picture adjustment mode in accordance with the adjusted value by means of the numerical value or a
25 bar displayed by OSD.

In the picture adjustment mode of a monitor according to the conventional technology, the user can confirm the actual picture adjustment result by using the OSD. However, the actual picture is not clearly distinguished from the entire region of the picture. Thus, the

picture adjustment result cannot be easily viewed on the picture, thereby posing a problem of failing to perform a picture adjustment as desired by the user.

SUMMARY OF THE INVENTION

To solve at least the problems and disadvantages of the related art, an object of the present invention is to provide an apparatus for displaying a guide line for picture adjustment in a monitor, which enables a user to easily adjust the picture and view the result thereof.

Additional advantages, objects, and features of the invention will be set forth in part in the following description and will become apparent to those having ordinary skill in the art upon examination of the following or may be learned from practice of the invention. The objects and advantages of the invention may be realized and attained as particularly pointed out in the appended claims.

To achieve the objects and in accordance with the purposes of the invention, as embodied and broadly described herein according to an aspect of the present invention, there is provided an apparatus for displaying a guide line for picture adjustment in a monitor, comprising a control section for recognizing a command for executing a picture adjustment mode from a user, and outputting commands for generating an OSD and a guideline, respectively; a guideline information providing section for receiving the command for generating the guideline from the control section, and outputting information related to forming the guideline; an image signal generator for receiving information related to forming the guideline from the guideline information providing section, and outputting an image signal to construct a picture including the guideline corresponding to the information related to the guideline; an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal to adjust a picture; an image amplifying section for combining the image signal including the guideline outputted from the image signal generator with the OSD image signal outputted from the OSD generating section; and a display section for displaying an output of the image amplifying section on a display screen.

Here, the information related to forming the guideline preferably includes at least one

kind of information between thickness and color of the guideline.

According to another aspect of the present invention, there is provided an apparatus for displaying a guide line for picture adjustment in a monitor, comprising an image signal generator for outputting an image signal to construct a picture; a control section for
5 recognizing a command for executing a picture adjustment mode from a user, identifying a command for generating an OSD for picture adjustment, and beginning and ending positions of an active region of the image signal, and outputting a guideline pattern signal for generating a guideline; an OSD generating section for receiving the command for generating the OSD from the control section, and outputting an OSD image signal; an image amplifying
10 section for combining the image signal outputted from the image signal generator, the guideline pattern signal outputted from the control section, and the OSD image signal outputted from the OSD generating section, and amplifying the combined signal; and a display section for displaying an output of the image amplifying section on a display screen.

Here, the control section preferably includes an active region detector for detecting
15 the beginning and ending positions of the active region of the image signals outputted from the image signal generator, and a guideline pattern generator for generating a guideline at the beginning and ending positions of the detected active region.

Also, the active region detector is preferably a high-speed detective IC used for auto-sizing.

According to still another aspect of the present invention, there is provided an
20 apparatus for displaying a guide line for picture adjustment in a monitor, comprising an image signal generator for generating an image signal to construct a picture; a control section for recognizing a command for executing a picture adjustment mode from a user, and identifying a position of generating a guideline in accordance with inputted horizontal/vertical
25 synchronous signals, and outputting a command for generating an OSD signal and the guideline signal for picture adjustment at the corresponding position; an OSD generating section for receiving the command for generating the OSD signal and the guideline signal from the control section, and outputting the OSD signal and the guideline signal; an image

amplifying section for combining the OSD signal, the guideline signal outputted from the OSD generating section, and the image signal outputted from the image signal generator, and amplifying the combined signal; and a display section for displaying an output of the image amplifying section on a display screen.

5 BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in detail with reference to the accompanying drawings, in which:

Fig. 1 is a block diagram showing a construction of the conventional device of displaying an OSD for a monitor.

10 Fig. 2 is a diagram showing an image signal waveform for embodying an OSD display window in Fig. 1.

Fig. 3 is a block diagram showing an OSD display picture according to the conventional technology.

15 Fig. 4 is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a first embodiment of the present invention.

Fig. 5 is a diagram showing an image signal waveform for embodying a picture adjustment guideline in Fig. 4.

Fig. 6 is a block diagram showing a picture adjustment guideline according to the present invention.

20 Fig. 7 is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a second embodiment of the present invention.

Fig. 8 is a block diagram showing a construction of a device of displaying a picture adjustment guideline for a monitor according to a third embodiment of the present invention.

25 DETAILED DESCRIPTION OF THE INVENTION

Preferred embodiments of the present invention will be described hereinafter with reference to the accompanying drawings.

Fig. 4 is a block diagram showing a construction of an apparatus for displaying a

guide line for picture adjustment in a monitor according to a first embodiment of the present invention. Fig. 5 is a diagram showing an image signal waveform for embodying a picture adjustment guideline in Fig. 4. Fig. 6 is a block diagram showing a picture adjustment guideline according to the present invention. Fig. 7 is a block diagram showing a construction of an apparatus for displaying guide line for picture adjustment in a monitor according to a second embodiment of the present invention. Fig. 8 is a block diagram showing a construction of an apparatus for displaying guide line for picture adjustment in a monitor according to a third embodiment of the present invention.

Embodiment 1

As shown in Fig. 4, the first embodiment of an apparatus for displaying a guide line for picture adjustment in a monitor according to the present invention includes an OSD generating section 42 for generating predetermined OSD image signals in accordance with a control signal outputted from a control section 41 inside of the monitor, an image signal generator 44 for generating image signals R, G, B to construct a picture including a picture adjustment guideline, a guideline information providing section 43 for transferring information related to forming a corresponding guideline to the image signal generator 44 in accordance with a command for generating a guideline outputted from the control section 41, an image amplifying section 45 for combining an OSD image outputted from the OSD generating section 42 with the image signals including the guideline outputted from the image signal generator 44, and amplifying the combined signals, a display section 46 for displaying an output from the image amplifying section 45 on the picture, and a control section 41 for outputting a command for generating the OSD to the OSD generating section by recognizing a command for implementing a picture adjustment mode from a user, and transferring a command for generating a guideline to the guideline information providing section 43.

An operation of the apparatus for displaying a guide line for picture adjustment according to a first embodiment of the present invention constructed above will now be described in further detail.

The user first inputs a picture adjustment menu key through a key input section of the

monitor. The control section 41 of the monitor subsequently recognizes the input.

The control section 41 locates a position to display an OSD in accordance with horizontal and vertical synchronous signals pre-inputted from a system in a main body of a PC. The control section 41 also transfers a command for generating an OSD to the OSD
5 generating section 42 so that an OSD of the picture adjustment mode can be displayed at the corresponding position. At the same time, the control section 41 also transfers a command for generating a guideline to the guideline information providing section 43.

Subsequently, the OSD generating section 42 outputs image signals for constructing the corresponding OSD in accordance with the control signal transferred from the control
10 section 41 to the image amplifying section 45. The guideline information providing section 43 recognizes the command for generating the guideline from the control section 41, and transfers the information related to the guideline such as thickness and color of the guideline to the image signal generator 44.

Accordingly, as shown in Fig. 5, the image signal generator 44 generates image
15 signals, including a guideline signal, image signals and OSD display window embodiment signal in the active region, and outputs the same to the image amplifying section 45.

The image amplifying section 45 combines an output of the OSD generating section 42 with an output of the image signal generator 44, and amplifies the combined signals to a predetermined level so as to be outputted to the display section 46.

As shown in Fig. 6, the display section 46 undergoes a series of signal processing
20 with an output of the image amplifying section 45, and displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

Embodiment 2

As shown in Fig. 7, the second embodiment of the apparatus for displaying a guide
25 line for picture adjustment in a monitor according to the present invention comprises: an OSD generating section 72 for generating a predetermined OSD in accordance with the control signal outputted from the control section 71 of the monitor; an image signal generator 73 for

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generating image signals R, G, B to construct a picture; a control section 71 for outputting a command for generating an OSD to the OSD generating section 72 by recognizing a command for implementing a picture adjustment mode from the user, and detecting an active region of the image signals R, G, B outputted from the image signal generator 73 by means of
5 an active region detector inside of the monitor so as to generate a guideline image at the corresponding position by means of a pattern generator inside of the monitor; an image amplifying section 74 for combining the OSD image signal outputted from the OSD generating section 72 and the image signals outputted from the image signal generator 73 with the guideline pattern signals outputted from the control section 71, and amplifies the
10 combined signals; and a display section 75 for displaying an output from the image amplifying section 74 on the picture.

Here, a high-speed detection IC is employed for the active region detector mainly used for auto-sizing.

An operation of the apparatus for displaying guide line for picture adjustment
15 according to the present invention constructed above will now be described herein below.

The user first inputs a picture adjustment menu key through a key input section of the monitor. The control section 71 subsequently recognizes the input.

The control section 71 then outputs a command for generating an OSD to the OSD generating section 72 so that the OSD for a picture adjustment mode can be displayed at the
20 corresponding position. At the same time, the active region detector inside of the monitor 71, e.g., the high-speed detective IC, detects the beginning and ending positions of the active region of the image signals R, G, B supplied from the image signal generator 73. The pattern generator inside of the control section 71 outputs the signal for generating guideline patterns at the corresponding position to the image amplifying section 74.

25 At this stage, the high-speed detective IC detects the image signals R, G, B and synchronous signals from the image signal generator 73, and transfers the information on the exact beginning and ending positions of the active region to the control section 71 upon request of an OSD by the user.

The OSD generating section 72 then outputs the image signal to construct the corresponding OSD to the image amplifying section 74 in accordance with the control signal from the control section 71. The image signal generator 73 outputs the image signals.

Subsequently, the image signal amplifying section 74 combines an output from the OSD generating section 72 and an output from the image signal generator 73 with the guideline pattern signals outputted from the control section 71, and amplifies the combined signals so as to be outputted to the display section 75.

As shown in Fig. 6, the display section 75 displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

10 **Embodiment 3**

As shown in Fig. 8, the third embodiment of the apparatus for displaying a guide line for picture adjustment in a monitor according to the present invention comprises: an OSD generating section 82 for generating an OSD and picture adjustment guideline image signals in accordance with the control signal outputted from the control section 81; an image signal generator 83 for generating image signals R, G, B to construct a picture; a control section 81 for outputting a command for generating the OSD and the guideline to the OSD generating section 82 by recognizing a command for implementing a picture adjustment mode from the user; an image amplifying section 84 for combining the OSD and the guideline image signal outputted from the OSD generating section 82 with the image signals outputted from the image signal generator 83; and a display section 85 for displaying an output of the image amplifying section 84 on the picture.

An operation of the apparatus for displaying a guide line for picture adjustment according to the present invention as constructed above will now be described herein below.

The user first inputs a picture adjustment menu key through a key input section of the monitor. The control section 81 subsequently recognizes the input.

The control section 81 then outputs a command for generating an OSD and a guideline to the OSD generating section 82 so that the OSD for a picture adjustment mode and the guideline can be displayed at the corresponding position.

The control section 81 can detect information on the beginning and ending positions of the active region in accordance with the horizontal and vertical synchronous signals transferred from a PC system. Thus, the control section 81 outputs the command for generating the OSD and the guideline to the OSD generating section 82 by means of the information on the corresponding position.

The OSD generating section 82 then outputs the image signals to display the corresponding OSD and the guideline to the image amplifying section 84 in accordance with the control signal from the control section 81. The image signal generator 83 outputs the image signals.

The image signal amplifying section 84 combines the OSD and the guideline image signal outputted from the OSD generating section 82 with the image signals of the image signal generator 83, and amplifies the combined signals to a predetermined level so as to be outputted to the display section 85.

As shown in Fig. 6, the display section 85 undergoes a series of signal processing based on an output of the image amplifying section 84, and displays the guideline and the OSD around the periphery of the picture so that the user can easily recognize the picture adjustment result.

As described above, the Embodiment 1 and the Embodiment 3 provide a guideline for clearly lining the boundary of the picture in a picture adjusting mode, e.g., when adjusting the size of the picture. Thus, the adjusted result clearly appears on the picture.

The result of the picture adjustment may be highlighted by embodying the guideline with a color contrasted with the picture such as a red color.

The apparatus for displaying guide line for picture adjustment in a monitor according to the present invention embodies a guideline around the periphery of the picture in a picture adjustment mode for clearly lining the boundary of the picture. Therefore, the present invention carries effects of enhancing a user convenience as well as a reliability of the product.

The foregoing embodiments are merely exemplary and are not to be construed as limiting the present invention. The present teachings can be readily applied to other types of

